FINAL PROJECT

COOLING LOAD AND HEAT TRANSFERS ANALYSIS FOR AIR CONDITIONING SYSTEM OF SUZUKI APV (GC 415)

RESEARCH PAPER

Submitted as a Partial Fulfillment of the Requirements for Getting the Bachelor Degree of Engineering in Automotive Department

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DECLARATION OF RESEARCH AUTHENTICITY

I assert verily that the research entitles:

COOLING LOAD AND HEAT TRANSFERS ANALYSIS

FOR AIR CONDITIONING SYSTEM OF

SUZUKI APV (GC 415)

That made to fulfill some of requirements to get bachelor degree of Engineering in Automotive Department of Muhammadiyah University of Surakarta, as far as I know it is not a plagiarism of a research that has been published, except the information source that used to solve the problem.

Surakarta, February 2011

writer,

Tunggul Dewa Perdana

VALIDATION SHEET

The final project entitles "Cooling Load and Heat Transfers Analysis for Air Conditioning System of Suzuki APV (GC 415)" has been Approved by supervisors for getting the Bachelor Degree of Engineering in Automotive Department of Muhammadiyah University of Surakarta.

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VALIDATION PAGE

The final project entitles "Cooling Load and Heat Transfers Analysis for Air Conditioning System of Suzuki APV (GC 415)" has been defended in front of examiners team and approved as a partial fulfillment of the requirements for getting the Bachelor Degree of Engineering in Automotive Department of Muhammadiyah University of Surakarta.

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SUMMARY

The condition of the earth is getting warmer temperature, forcing people to seek various ways to avoid the warm air. Similarly, while driving car, people often felt the warm in the cabin. So, one of solutions to these problems are use Air Conditioning System (A/C) to reduce warm temperature in the cabin. Also, air conditioning can removes moisture in the windshield when driving in rainy.

Cooling load calculation includes sensible heats from outdoor and latent heats from indoor. Sensible heats are heat transfers from sunlight through car body to interior cabin. Latent heats are heat transfers from passengers and air vent. Total of heat transfers will produce a total of heat in the car cabin. Then total of heat transfers converted into the power to determine Air Conditioning capacity. Good calculation of cooling load will greatly affect the condition of the room and also used to determine specifications of Air Conditioning components. Suzuki APV uses non frosting evaporator coil with fins, condenser uses air condenser type with finned flat tube and air as a cooling fluid, compressor uses swash plate compressor type, and expansion valve uses thermostatic expansion valve. Exact calculation of cooling load will reduce excessive fuel consumption due to the use of Air Conditioning.

Air Conditioning system of Suzuki APV uses basic of vapor compression cycle and R-134a (HFC-134a) as a refrigerant. Total of sensible heat load is 5,687.68 Btu/hr and total of latent heat load is 1,164.11 Btu/hr. So, total of Air Conditioning capacity is 2.69 hp (3 hp rounded). By using refrigerant R-134a, refrigeration system of Suzuki APV has 89 % efficiency.

Key words: evaporator, compressor, condenser, expansion valve and refrigerant

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The writer realizes that this final project paper is far from being perfect, so the writer sincerely welcomes any constructive comment, criticism, and suggestion from anyone.

Wassalamualaikum Wr. Wb.

Surakarta, February 2011

The writer

MOTTO

Prayer gives strength to the weak, making people does not believe to be believed and to give courage to those who fear.

(Nasrul Kurniawan)

Our task is not to succeed. Our task is to try, because in trying that we find and learn to build an opportunity to be success.

(Mario Teguh)

To live this life, everyone must pay attention from various sides. Each side should be set so that humans can live properly. If there is one side of the forgotten, the ultimate goal man would not be achieved perfectly. Only by setting a true human being can achieve the ultimate goal of this life.

(Haryanto P.O)

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